REMARKS/ARGUMENTS

No claims are amended or canceled by this response. Accordingly, claims 1-3, 5-6, 9-12, 14-17, and 19-25 remain pending.

Embodiments in accordance with the present invention relate to simulating the expensive and complex clinical trials that are used to evaluate performance of drug candidates. As described in the background of the instant application, such clinical trials include a protocol providing dosage and observation schedules. For each subject of the clinical trial, the dosage schedule indicates timing for drug administration, and how much of the drug is to be given at each time. The observation schedule identifies observations or measurements to be taken, and the times for those observations or measurements. (See ¶[04]) The instant application also emphasizes the variable nature of these protocol schedules:

> simulation of an individual subject requires simulating the time sequence of the various independent dosing and observation schedules. Furthermore, schedules must be capable of dynamic modification during the trial in order to simulate dose adjustment protocols that respond to factors in the trial such as disease progress. (Emphasis added; ¶[05])

One conventional approach to simulating a clinical trial is to compute the schedules for each subject in advance, with the multitude of schedules combined in a single master schedule adhered to for the entire simulation. However, such use of pre-determined schedules:

> lacks the flexibility to modify any schedule in response to data generated during the simulation, as is required for dose adjustment protocols. (Emphasis added; ¶[07])

In order to avoid this disadvantage, embodiments in accordance with the present invention are configured to receive clinical trial protocol information in the form of a plurality of independent schedules, such as dosing schedules and observation schedules. Source code is then generated and compiled to produce a state machine corresponding to each schedule. (See ¶[11-12]) These state machines are executable according to a time-ordered queue. (See ¶[61-64])

Such a simulation structure offers the advantage of enhanced flexibility. Specifically, as the state machines are able to represent schedules of which some of the quantitative and

qualitative specifics are not predetermined, but rather are determined during the simulation in response to information generated during the simulation.

An example illustrating the variable nature of the schedules may be found at ¶[85] of the instant application, where "T1" is defined as a variable, and, as such, its value is determined at run time (i.e. simulation time), and can be different not only from subject to subject, but from event to event. This variable T1 can vary in accordance with random numbers generated at run time and not known in advance.

Accordingly, pending independent claims 1, 9, 14, and 19 recite as follows:

> 1. A system for clinical trial simulation, comprising:
> . . . a compiler . . . configured to compile the generated source code into an executable program comprising a plurality of programmable state machines, each state machine corresponding to one of the plurality of schedules; and
> a controller . . . configured to run the executable program including the plurality of programmable state machines, according to a time queue. (Emphasis added)
>
> * * *
>
> 9. A method for clinical trial simulation, comprising:
> . . . compiling the translated plurality of schedules into an executable program comprising a plurality of state machines, each state machine corresponding to one of the plurality of schedules; and
> executing the program including the plurality of state machines, according to a time queue as part of the clinical trial simulation. (Emphasis added)
>
> * * *
>
> 14. A computer readable medium having stored thereon one or more sequences of instructions for causing one or more microprocessors to perform the steps for simulating a clinical trial, the steps comprising:
> . . .compiling the translated plurality of schedules into an executable program comprising a plurality of state machines, each state machine corresponding to one of the plurality of schedules; and
> executing the program as part of the clinical trial simulation including the plurality of state machines, according to a time queue. (Emphasis added)
>
> * * *
>
> 19. A system comprising a microprocessor, a persistent storage area, a volatile storage area and a communication means, the system including an execution area configured to simulate a clinical trial by performing the following steps:
> . . . compiling the translated schedules into an executable program, the executable program comprising a plurality of programmable state machines, each state machine corresponding to a discrete one of the plurality of schedules; and

executing the program as part of the clinical trial simulation including the plurality of state machines, according to a time queue. (Emphasis added)

In the latest office action, the Examiner rejected the pending claims as obvious based upon U.S. patent no. 6,108,635 to Herren et al. ("the Herren Patent"), in combination with a number of other references. These claim rejections are traversed as follows.

The Herren patent describes a system comprising a plurality of modules designed to support the development of medical treatments. One such module, the "Clinical Trials Explorer", calls for the user to manually enter information regarding a "regimen" for treatment or intervention. (Col. 29, lines 55-56; col. 30, lines 4-6; and Fig. 12b, col. 30, lines 64-64). As explicitly acknowledged by the Examiner, however, the Herren Patent fails to teach simulating a clinical trial according to a protocol comprising a plurality of schedules, never mind the use of state machines executed according to a time queue, as is recited by the pending claims.

In an effort to provide such a teaching, the Examiner has combined the Herren Patent with U.S. Patent No. 6,820,235 to Bleicher et al. ("the Bleicher Patent"). The Bleicher Patent relates to web-based systems and methods for managing data received from an actual clinical trial. (See Abstract) The Bleicher Patent focuses, therefore, on the organization and display of data which has already been generated by a clinical trial. For example, Figure 4A (reproduced below) of the Bleicher patent depicts an exemplary Web page, designed to organize and display clinical trial data in a manner facilitating rapid review and analysis by a user:

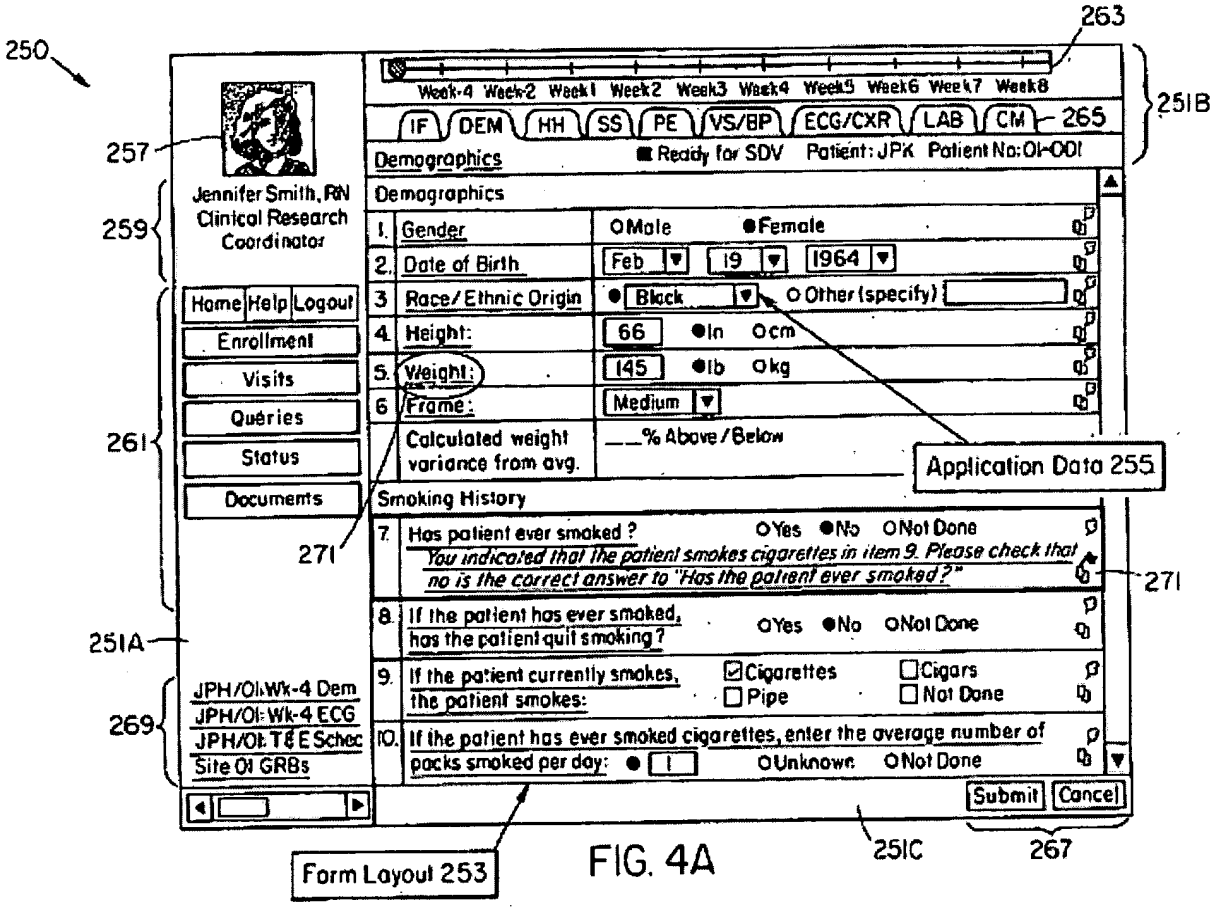


FIG. 4A

This primary role of the Bleicher patent, to organize and display clinical trial data, stands in marked contrast to embodiments of methods and systems in accordance with the present invention, which are designed to generate data by simulating a clinical trial.

The Examiner is reminded that in order to establish a prima facie case of obviousness, "the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP 2142. Here, there is absolutely no teaching, or even suggestion, in the Bleicher Patent to simulate a clinical trial in the manner recited by the pending claims.

In rejecting the pending claims in view of the Bleicher Patent, the Examiner relied exclusively upon the following passage:

> Every clinical trial has a protocol which specifies the exact timing and nature of the measurements and interventions to be performed on each patient. The protocol's time-line lists a series of events, or visits, where the data are collected from the study patient. The time-line of a typical study starts with the

screening and enrollment of a patient and typically ends with the last patient visit. (Col. 2, lines 8-14)

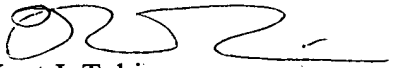
The above paragraph presents only a simple background description of a protocol for a clinical trial. It says nothing at all regarding simulating such a clinical trial, never mind a particular implementation of such a clinical trial simulation utilizing state machines corresponding to different schedules, executed according to a time queue. The Examiner can hardly rely upon this, or any other portion of the Bleicher patent, to teach or suggest simulating a clinical trial in the specific manner recited by the pending claims.

Moreover, the remaining references relied upon by the Examiner also fail to teach simulating a clinical trial in the manner claimed. For example, U.S. patent no. 6,268,853 to Hoskins et al. ("the Hoskins patent") relates to control tools for an industrial process, and contains no mention of a clinical trial for evaluating performance of a drug candidate. U.S. patent no. 6,408,431 to Heughebaert et al. ("the Heughebaert patent") describes generating code for a software program in multiple languages, but relates not at all to simulation of a clinical trial. U.S. patent no. 6,708,329 to Whitehill et al. ("the Whitehill patent") relates to computer simulation of a target system, but contains no teaching or suggestion to simulate a clinical trial.

Because the patents relied upon by the Examiner fail to teach or suggest all of the elements of the pending claims, it is respectfully asserted that these claims cannot be considered obvious in light of those references. Continued rejection of the pending claims is improper, and the obviousness claim rejections should be withdrawn.

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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